B-4  Bone Composition and Bone Mineral Density in Alitie Athlete

Hideyuki TAKAHASHI, Yukiomi MIYATA, Shoji IGAWA
( Nippon College of Physical Education)

We investigated in bone mineral density (BMD) and %fat on aerobics exercise instructor (AERO), gymnastic competitor (GYM) and swimmer (SWIM). BMD and %fat were measured with Dual Energy X-ray absorptiometry (DEXA). Low BMD and %fat in some of groups were found.
It was suggested that diet or lifestyle and so on had cause.

B-5  Body composition from bioelectrical impedance detected between the sole of feet in the standing position

Fumio NAKADOMO1, Kenji WATANABE2, Nobutoshi SHIGEMATSU2, Kyoji TANAKA3, Takamori MATSUO2, Toyoaki OKUDA2, and Kazuya MAEDA2
1) Osaka Prefectural College of Nursing, 2) Osaka City University
3) Institute of Health and Sport Sciences, University of Tsukuba, 4) Toyo LTD.

This study aimed to assess the body composition from bioelectrical impedance (2) detected between the sole of feet in the standing position. Z was measured by use of a portable four-terminal bio-impedance analyzer (Seleco, SF-89) with copper electrodes. The distance between the current-introducing electrode and the electrode detector was maintained at 50 mm in both test. Z was significantly lower when same electrodes with a diameter of 5.5 mm were used. No differences existed in Z obtained between three kinds of electrodes with a diameter greater than 23.5 mm and less than 23.5 mm. Correlations between these kinds of electrodes were 2.981 and greater. The effect of contact pressure (5-100 kg) on Z was negligible. Differences between the sole of feet (15-44 cm) were affected by Z. Z (445.465 x 9.59.5 in healthy adult men and women (n=67); 2) the sole distance = 34 cm (3) the sole of feet is wiped with a wet duster, and 4) the upper legs do not contact each other. However, the mean difference of approximately 50 mm was significant, so that we propose to use y = 1.2x - 35.5, where y = standard Z and x = measured by the sole method in the standing position. Cross-validation of this equation was high in both (n=938, n=191, girls (n=938, n=191), and adult women (n=2857, n=30).
 Consequently, we suggest that the convenient method proposed in this study can be applicable to the simultaneous assessment of body weight and body composition or prior to bathing.

B-6  Effect of body composition of a low-energy, low-protein diet

Toyoaki OKUDA1,2, Tatsuo OGIWA1,2, Akiko YAMAGATA3,1, Kent TANIGUCHI3,2, Yoko Sugawara-KATAYAMA1,2, Kenji WATANABE1,2, Fumio NAKADOMO1,2, Yasuo YAMAGUCHI3
1) Faculty of Science of Living, Osaka City University
2) Osaka Prefectural College of Nursing
3) College of Integrated Arts and Sciences, University of Osaka Prefecture

The purpose of this study was to examine the short-term effects of a low-energy, low-protein, vegan diet on the body composition of middle-aged women. The vegan diet contained 120 g of brown rice, 430 g of five varieties of leafy green vegetables, 490 g of three kinds of nuts, 80 g of fruits, and 10 g of salt daily. Body fat was measured in 11 women aged 52 ± 13 years (mean ± SD) by bioelectrical impedance. Their mean protein intake and protein intake were 16.2 ± 11 kcal/kg and 0.57 ± 0.05 g/kg, respectively. Base-line body weight, %fat, max fat, and fat-free mass (FFM) were 47.9 ± 2.3 kg, 23.1 ± 1.9%, 11.1 ± 1.0 kg, and 36.5 ± 1.2 kg. After 6 weeks, the decrease in body weight by 4.4 ± 0.6 kg, %fat by 6.4 ± 1.4%, and fat mass by 3.9 ± 0.7 kg were significant. The decrease in FFM was not significant (0.5 ± 0.5 kg). Of the total weight loss, 89.6% was loss of fat mass and 11.4% was loss of FFM. The daily loss of energy from fat mass was 674 ± 126 kcal, and the daily loss of energy from FFM was 10 ± 11 kcal. The daily loss energy from the body was 15.7 ± 2.7 kcal/kg, which was close to the energy intake. Subjects used energy from body weight loss for basal metabolism and physical activity. There was no excess loss of FFM in middle-aged women on a low-energy, low-protein, vegan diet for 6 weeks.

B-7  The Effect of Body Composition on Physical Fitness and Motor Ability in Junior High School Boys and Girls

Kenji WATANABE1, Fumio NAKADOMO1, Masayuki MIYAKE2, Kyoji TANAKA3, and Kazuya MAEDA2
1) Osaka Prefectural College of Nursing
2) Institute of Health and Sport Sciences, University of Tsukuba
3) Department of Health Science and Physical Education, Osaka City University

The purpose of this study was to clarify the relationship of body composition with five motor ability elements and six physical fitness elements including maximal oxygen uptake (V02max, ml/kg/min) in junior high school students. The subjects were 144 boys and girls, aged 12-15 years. Body composition was measured by bioelectrical impedance method. The subjects were categorized into three groups according to their percentage of body fat (%Fat); lean (fat < 12%), obese (fat ≥ 20%), and intermediate (12 ≤ fat < 20%) for boys, and lean (fat < 15%), obese (fat ≥ 25%), and intermediate (15 ≤ fat < 25%) for girls. Results were as follows: 1) Physical fitness test: In boys the obese group was significantly inferior in side step and vertical jump to the other two groups, while in girls no significant differences existed between three groups. 2) Motor ability test: In boys the obese group was significantly inferior in chin-ups and 1500-m run to the other groups. In girls, the obese group was significantly inferior in 30-m run, running long jump and one-ops to the other groups. 3) V02max values of the obese group in both sexes were significantly lower than those of the other groups. No significant group differences existed for V02max per LBM (ml/kg/min).

B-8  Effect of Low Ca Diet and Exercise on Bone Mineral Density

Yukimori MIYAKE1, Setsuji TAKAMA1, Takumi MATSU1, Akihito UJIYAMA1, Kenji WATANABE2, Shoji IGAWA2, and Shuichi KOBAYASHI2
1) Department of Sports Science, Nippon College of Physical Education
2) Department of Exercise Physiology, Nippon College of Physical Education

This study examined the effect of low Ca diet and exercise on bone mineral density by Dual Energy X-ray Absorptiometry (DXA). Eighteen male rats at 30-weeks of age were divided into four groups: normal diet-control (NC: n=4), normal diet-exercise (NE: n=4), low Ca diet-control (LC: n=4) and low Ca diet-exercise (LCE: n=4). Exercise consisted of running on a treadmill (80% of VO2max, 1 hr/day for 2 weeks).

The results of our study were summarized as follows:
1) Bone mineral density (BMD) of femur was significantly higher in NC and NE than that in LC and LE groups.
2) No difference in BMD of femur was found between non-exercise and exercise groups. These results suggest that low Ca diet has a negative influence and exercise has no effect on BMD in this study.

B-9  Aging Changes in Body Volume and its Estimation for Japanese Males and females, Aged 10 to 60

Yasuko TAHARA, Noriko TSUNAWAKI, Koushi YUKAWA, Masahito YAMASAKI, Tezuo KATSUYUKA and Yasuyuki KIKUCHI
1) Department of Health and Physical Education, Faculty of Liberal Arts, Nagasaki University
2) Nagasaki P.W.I.C. 3) Nagasaki University 4)Hiroshima University 5)Chiba University

The present study is to determine human body volume (Hydrostatics=Under-water weighing/weight=weight--water volume/density of water)--residual lung volume, according to aging, and estimate it from anthropometric measurements on 1345 Japanese males and females, aged 10 to 60. Mean values of body volume on males (females) were 346 ± 33.0 kg (55.0 kg) in 11.0-year-olds, 60.1 ± 5.9 (52.2 kg) in 20.0-22.4 kg, 61.2 ± 5.2 (52.2 kg) in 40.4-44.9 kg, and 64.5 ± 5.1 (52.2 kg) in 55.0-59.9 kg. Multiple regression equations for predicting body volume (BV): All Subjects: BV (male)=0.057688++0.001597x+0.01186x+0.5974[MAB-0.0998;CD-0.0988;SE=0.0477], BV (Female)=0.058689+0.003194x+0.1697[MAB-0.0998;CD-0.0988;SE=0.0477]. Senior high school students and those others:BV (male)=0.058824+0.01146x+0.006684x+0.15380[MAB-0.0979; CD-0.0996;SE=0.0659], BV (Female)=0.049787+0.013587x+0.006383x+0.04225[MAB-0.0973; CD-0.0985;SE=0.0485]. [H,Height; W,Weight; A, Age]